THE DESIGNER'S PENCIL™

Instructions for the Commodore 64™

INTRODUCTION

The Designer's Pencil™ is a powerful but easy tool. We recommend that you simply play with it awhile. And when you feel ready, begin reading these instructions. Soon, you will be able to design thousands of pictures, as well as compose or transcribe three-part music. Along the way, you are introduced to many important computer programming concepts and will earn their gratifying rewards.

ACTIVISION.

GETTING STARTED

- Set up your computer system. Follow manufacturer's instructions.

- **If using a disk,** type: Load " ✱ ",8,1 then press RETURN.

- **If using a cartridge,** insert it into your computer with power OFF. Then, turn power ON.

- Hit **RESTORE** key to return to title screen at any time. Be careful not to accidentally hit RESTORE once writing a program. Doing so will destroy any program you may have been working on.

THE CONTROLS

The Designer's Pencil™ can be used with either the keyboard or a Joystick plugged into port one.

Exit the title screen by pushing the button on the Joystick or pressing the space bar on the keyboard. **Try it!**
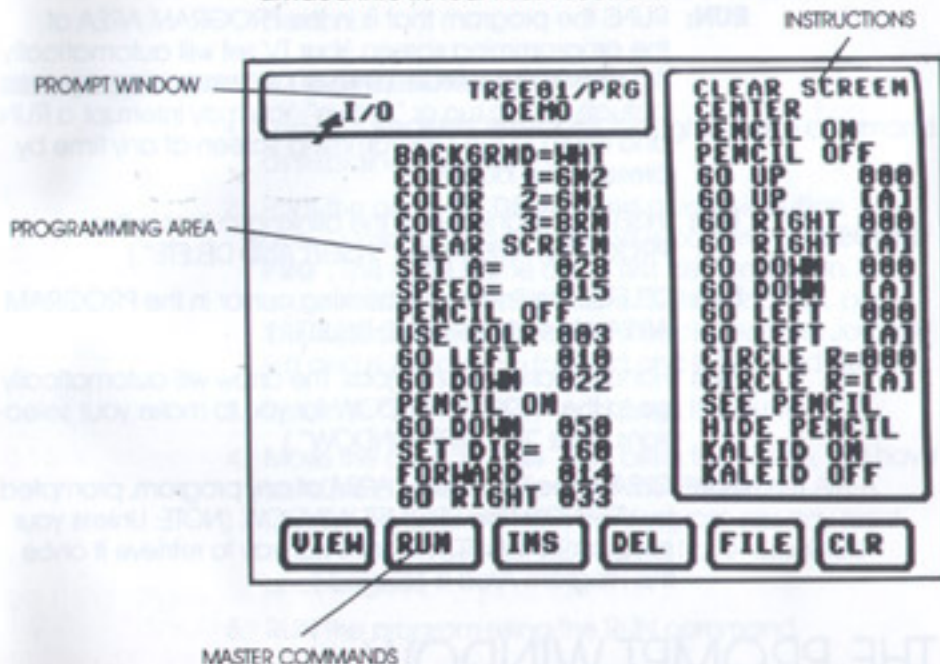
You are now looking at the **PROGRAMMING SCREEN.** All program designing is done here. The flashing arrow is your programming pointer. Right now, you can see that it is pointing at the VIEW command. Move the arrow UP, DOWN, LEFT or RIGHT with the Joystick. If using the keyboard, F1=UP, F3=LEFT, F5=RIGHT and F7=DOWN. **Try it!** Move the arrow around a bit. Then, return the arrow to the VIEW command.

Using **The Designer's Pencil™** is just like programming except that you don't need to type or memorize any commands or instructions. **All of the program designing is done by a combination of moving the arrow to the command or instruction you desire and pressing the button.** By pressing the button, you are executing a command or initiating an instruction.

NOTE: *This manual assumes you are using a Joystick. If using the keyboard, press the space bar when we refer to the button on the Joystick. Also, if you'd like to draw freehand using the Joystick, see "Instructions" section "SKIP IF J2=UP".*

THE PROGRAMMING SCREEN

The diagram below shows the PROGRAMMING SCREEN divided into its four main sections.

INSTRUCTIONS

PROMPT WINDOW

```
       I/O        TREE01/PRG      CLEAR SCREEN
                   DEMO           CENTER
                                  PENCIL ON
       BACKGRND=WHT               PENCIL OFF
       COLOR  1=GN2               GO UP      000
       COLOR  2=GN1               GO UP      [A]
       COLOR  3=BRN               GO RIGHT   000
       CLEAR SCREEN               GO RIGHT   [A]
       SET A=     028             GO DOWN    000
       SPEED=     015             GO DOWN    [A]
       PENCIL OFF                 GO LEFT    000
       USE COLR 003               GO LEFT    [A]
       GO LEFT    010             CIRCLE R=000
       GO DOWN    022             CIRCLE R=[A]
       PENCIL ON                  SEE PENCIL
       GO DOWN    050             HIDE PENCIL
       SET DIR= 160               KALEID ON
       FORWARD    014             KALEID OFF
       GO RIGHT 033
```

PROGRAMMING AREA

[VIEW] [RUN] [INS] [DEL] [FILE] [CLR]

MASTER COMMANDS

THE MASTER COMMANDS

The six small rectangles at the bottom are your **Master Commands.** To execute one, point the arrow to the command desired and press the button. The Master Commands are:

VIEW: VIEWS the DRAW PAGE. To exit the draw page, press the button again. Exiting the draw page always returns you to the programming screen with the arrow pointed at the VIEW command.

RUN: RUNS the program that is in the PROGRAM AREA of the programming screen. Your TV set will automatically flip to the DRAW PAGE, and you will see your program actually being run or "drawn". You may interrupt a RUN and return to the programming screen at any time by pressing the button.

INS: INSERTS a blank line at the blinking cursor in the PROGRAM AREA. (See "INSERT AND DELETE".)

DEL: DELETES the line at the blinking cursor in the PROGRAM AREA. (See "INSERT AND DELETE".)

FILE: Handles various FILING jobs. The arrow will automatically go to the PROMPT WINDOW for you to make your selections. (See "PROMPT WINDOW".)

CLR: CLEARS the PROGRAM AREA of any program, prompted by YES/NO in the PROMPT WINDOW. (NOTE: Unless your program is "SAVED", there is no way to retrieve it once the Program Area is cleared.)

THE PROMPT WINDOW

The PROMPT WINDOW is where you access the twelve **DEMO**nstrations that show some of the capabilities of **The Designer's Pencil.**™ It is also where you will SAVE and LOAD your own programs and pictures. (More on SAVE and LOAD later.)

You will normally use or enter the PROMPT WINDOW by first pointing the arrow at the FILE command at the bottom of the screen and pressing the button. The arrow automatically jumps to the PROMPT WINDOW. Then, point the arrow at the "prompted" decision you choose to make. Remember to press the button to execute your "prompted" decision.

NOTE: Normally, to enter the PROMPT WINDOW, point the arrow at the FILE command first, and press the button.

TO RUN DEMONSTRATIONS:

1. Enter the **PROMPT WINDOW** through the **FILE** command as explained above.

2. Point the arrow at "**DEMO**" and press the button. The arrow jumped up one line and is pointing at "**BEGINR/ PRG**". This is the name of the first demonstration. To cycle through the list of twelve "DEMO" names, push the Joystick forward and pull it back. Lean the Joystick left and right to cycle forward and backward quickly.

3. Return to "BEGINR/PRG" and press the button.

4. Move the arrow to "**YES**" and press the button. You have just LOADED this program into the PROGRAM AREA. (If you had chosen "**NO**", the program already residing in the PROGRAM AREA would have remained unchanged.)

5. RUN the program using the RUN command.

   To RUN the rest of the demonstrations, follow the same procedure. Select a different demonstration "filename" each time.

   Oh, yes. Turn the volume up on your TV. You'll soon hear why.

BLANKING THE DRAW PAGE

When you begin to program your own designs, always blank-out the draw page first. This allows you to start with a "fresh piece of paper."

■ HERE'S HOW!

1. Move the arrow to the **CLR** command and press the button. The arrow jumps to the Prompt Window.

2. Execute the **"YES"** instruction. The **CLR** and **YES** combined clear the Program Area.

3. Execute the **RUN** command. After clearing the Program Area, the **RUN** command blanks the Draw Page.

   Four important conditions exist once you blank the page and are ready to begin a new program:

1. The page is WHITE.

2. You can SEE the pencil, as opposed to being invisible.

3. The pencil is located at the CENTER of the page.

4. The pencil is ON the page. This means that the pencil will draw when moved about, as opposed to simply being repositioned **without drawing** when moved about.

NOTE: Always blank the draw page when you begin programming a new design.

CREATING A SIMPLE CIRCLE

You are now ready to create your first program. After returning to the programming screen by pressing the button, you will notice the blinking cursor. **The blinking cursor marks the location of the next instruction of your program.**

The first five lines you see in the Programming Area are always included for you at the start of any program.

TO CREATE A CIRCLE:

1. Move the arrow over to the instruction window and point to "CIRCLE R=000". (Scroll up or down through the instructions until you find this instruction.)

2. Press the button. You'll notice that your instruction is now part of your program. Because this instruction needs additional information, it is highlighted in red.

3. Move the Joystick until the number 035 appears and press the button.

4. Execute the RUN command.

Congratulations! You have just completed your first program.

TO EXPERIMENT WITH OTHER CIRCLE SIZES:

1. Point the arrow at the "035".

2. Press the button.

3. Move the Joystick to select a radius for other sizes.

4. Press the button again.

5. Execute the RUN command.

NOTE: Instructions that are highlighted RED in the Programming Area require additional information, or some sort of change.

THE PROGRAMMING AREA

As you can see, the Programming Area and the Instruction Window work very closely with each other. The Programming Area is where you "build" or "create" your programs. The Instruction Window is where you select the instructions.

Many instructions in your programs, like "CIRCLE R=035", can be changed once they are already in the Programming Area. Point the arrow to where you wish to make the change and press the button.

TO MAKE A CHANGE IN PROGRAMMING AREA:

Using your circle program.

1. Point the arrow at "WHT" in the first program instruction "BACKGRND=WHT".

2. Press the button.

3. Move the Joystick until "BLK" appears.

4. Press the button and execute a RUN.

   The BACKGROUND changed from WHITE to BLACK.

NOTE: *To CHANGE a color, numerical value or musical note in the Programming Area, point the arrow where you wish to make the change and press the button. Move the Joystick to make your new selection, then press the button again.*

INSERT and DELETE

There are many occasions when writing a program that you will want to INSERT a new instruction between two existing instructions, or even DELETE an instruction. Both are very simple to do with **The Designer's Pencil.**™

Let's use your circle program to learn how to INSERT an instruction.

FIRST, DO THIS:

1. Draw a circle with a radius of 017.

2. Change the background to BLACK.

3. Change "COLOR 1=RD1" to "COLOR 1=YEL". (Just point the arrow at "RD1", press the button and move the Joystick until "YEL" appears and press the button again.) "RD1" stands for the first shade of red. "RD2" is the second shade. There are 16 available colors.

4. RUN the program.

   You should see a yellow circle on a black background. When you are finished admiring your work, return to the programming screen.

NOW, TO INSERT AN INSTRUCTION:

1. Point the arrow **at the beginning** of your "CIRCLE R=017" instruction and press the button. The blinking cursor should appear at the beginning of the "CIRCLE R=017" instruction.

2. Point the arrow at the **INS** command and press the button once. The "CIRCLE R=017" instruction dropped down one line. Each time you press the button, one blank line is inserted.

3. Point the arrow at the "USE COLR 000" instruction in the Instruction Window and press the button once.

4. Change the "000" to "002".

5. RUN the program.

   Wonderful! You just INSERTED an instruction which in this case turned your circle green. Can you figure out why your circle turned green?

   The answer is that when you INSERTED "USE COLR 002", your program drew with the COLOR that was set in COLOR 2 at the top of your program, which was GREEN.

TO DELETE AN INSTRUCTION:

Point the arrow directly **at the beginning** of the instruction that you want to DELETE and press the button. Then point the arrow at the **DEL** command and press the button. Each time you press the button, you DELETE one line.

TRY THIS!

Delete the "USE COLR 002" instruction as just explained. Be certain to press the button only once! Otherwise, you will also delete your "CIRCLE R=017" instruction. Now, RUN your program.

Your circle has returned to yellow. The reason is that **The Designer's Pencil™** always draws with the color in "COLOR 1" at the top of your program unless you specify otherwise.

Well, you're getting pretty good. You can move the arrow around the screen. You can execute the commands. You can draw a circle and change colors. It's time to learn each instruction in the Instruction Window.

Many of them are self-explanatory. Just by experimenting, you could probably figure them out. But, don't worry. You can't harm the system by putting in a wrong instruction. If you don't like what you have, just blank the draw page and start over.

What follows is an explanation of ALL of the instructions; even the ones that seem obvious to YOU.

THE INSTRUCTIONS

To start off, let's make it just a bit easier. You will notice that many instructions have near-duplicates; even at the start.

The 1st instruction is: "COLOR 1=BLK".

And, the 2nd instruction is: "COLOR 1=[A]".

The 2nd instruction includes the **variable [A]**. **Variables** are very important functions to programming, and we will discuss them as a topic themselves. (See "VARIABLES, LOOPS and LABELS".)

Also, we will skip some of the instructions as they appear in order in the Instruction Window and discuss them later.

COLOR 1,2,3 = BLK: Changes the colors selected at the top of your program.

CLEAR SCREEN: Clears the draw screen as your program runs.

CENTER: Puts the pencil at the center of the screen. The screen contains 160 dots horizontally (X Axis) numbered 0-159, and 184 dots vertically (Y Axis) numbered 0-183. The center is at 79,91 (X,Y).

PENCIL ON: Pencil will draw with selected color.

PENCIL OFF: Pencil will move around without drawing.

UP,RIGHT,DOWN, LEFT 000: Moves the pencil by that number and in that direction. The number ranges 000-255.

CIRCLE R 000: Draws a circle of radius 000-255.

SEE PENCIL: The pencil is visible as it moves around.

HIDE PENCIL: The pencil is invisible.

KALEID ON: Sets kaleidoscope draw mode on. Anything that is drawn will be copied automatically in the other 3 quadrants of the screen. This instruction creates wonderful effects, and is best used with the pencil hidden!

KALEID OFF: Turns kaleidoscope draw mode off.

USE COLR 000: Selects which of the four colors to draw with. Drawing with Color 000 uses the background color and is equivalent to erasing.

BACKGRND=BLK: Changes background color to the one selected.

FILL: Fills in an enclosed area. The pencil must be positioned **within the area** (not on the edge). Sometimes the pencil will not completely fill an area. When this happens, reposition the pencil in the unfilled area(s) and use the FILL instruction again. "Fill" automatically puts the pencil ON the page.

WRITE "A": Prints a letter A-Z, some punctuation, 0-9 and the Activision LOGO. Do not confuse with "WRITE [A]". "WRITE" automatically puts the pencil ON the page. However, when you are through "WRITE"ing, the pencil will be OFF the page. To resume drawing, you must put the PENCIL ON the page.

NOTE CH1,2,3 RST: Plays a note for 1/10th of a second in the specified channel (1,2,3). There are 3 channels, each supporting 5 octaves. **RST** means rest, and no note will be heard. Instruction format is NOTE CH1 = C#3...where 1 is the channel and 3 is the octave (1-5). Channel 1 (CH1) MUST be played before channels 2 or 3. Do not place any instructions that are not NOTEs between CH1 and CH2 or CH3, or else CH2 and CH3 will not be heard. To play a note longer than 1/10th of a second, repeat the NOTE instruction.

SPEED: Sets the drawing speed (0 = SLOW, 15 = FAST). If you don't use this instruction, the program runs at SPEED 4.

STOP: Stops the program. A blank line will also stop the program. (See "RECURSION" for additional STOP information.)

SET DIR = 000: Draws diagonal lines. Pencil direction used only in conjunction with FORWARD/BACKWARD instructions. (See below.) Pick direction (angle) from 0-255. 0 = UP, 64 = RIGHT, 128 = DOWN and 192 = LEFT.

FORWARD 000: Move pencil in selected direction (see above) by amount selected. Ranges 000-255.

BACKWARD 000: Move pencil in opposite direction from FORWARD by amount selected. Ranges 000-255.

ROTATE R 000: Adds an offset to direction. "ROTATE R 064" turns a quarter of a circle to the right.

ROTATE L 000: Subtract offset from directions. "ROTATE L 064" turns a quarter of a circle to the left.

VARIABLES, LOOPS and LABELS

Variables are letters (A-Z) that store numbers. Whereas a number itself cannot ever be worth a different numeric value (3 is always equal to 3), a **variable** can store a different number at different times throughout a program.

Let's pretend that you want to hear all five octaves that **The Designer's Pencil**™ supports. That includes 60 notes; 12 notes per octave. Using a **variable [A]** you could hear all 60 notes by writing just four instructions.

HERE'S HOW!

1. Clear any program in memory.

2. Point the arrow at the "SET A=000" instruction and press the button. Move the Joystick and see that you can cycle through all 26 letters in the alphabet. Return to "A" and press the button again. Then, press the button again, leaving "SET A=000".

3. Scroll down the Instruction Window and find the instruction "A=A+000", and press the button. (You can scroll both "A's" through all of the letters, but leave them both as "A".) Then, move the Joystick so the instruction reads "A=A+001". (NOTE: "A=A+001" is not a correct mathematical expression. That would be impossible. With computers, "A=A+001" means that the left-side "A" is now equal to itself "plus 1". This is called a "counter".

4. Put the instruction "NOTE CH1=[A]" on the next program line.

5. Find the instruction "JUMP TO L001" and press the button. ("JUMP TO L001" will be explained later.)

6. Lastly, position the arrow to the FAR LEFT edge of the screen on the "A=A+001" line, and press the button. "L001" should appear. Press the button again. The FAR LEFT edge is reserved for "labels". To MOVE a "label", point the arrow at it, press the button and move the label anywhere up or down the FAR LEFT edge of the Program Area. If you want to get rid of a label, you can "hide" it under another label and it will disappear from your program. "L001" is a label. (See "JUMP TO L001" for a further discussion of labels.)

YOUR PROGRAM SHOULD LOOK LIKE THIS:

```
BACKGRND = WHT
COLOR 1   = RD1
COLOR 2   = GN1
COLOR 3   = BL1
CLEAR SCREEN
SET A = 000
L001 A = A + 001
NOTE CH1 = [A]
JUMP TO L001
```

Now, RUN your program. Press the button after you have heard all of the notes play a couple of times.

HERE'S WHAT HAPPENED:

You set "A" equal to 0. Then you played a note in channel 1 equal to 0. Next, you increased the value of "A" by 1, so that "A" now equals 1. Lastly, your "JUMP TO L001" instruction sent the program back to the instruction with the "label", in this case "L001". Your program then played a note in channel 1 equal to 1. The process repeated itself indefinitely, increasing the value of "A" by 1 each time.

This program is said to have gone into an infinite LOOP. It will NEVER stop cycling through the infinite LOOP of playing all five octaves unless you press the button.

Loops do not have to be infinite, however. To make your program discontinue its loop AND still hear all 60 notes, insert the instruction "SKIP IF A = 060" between "NOTE CH1 = [A]" and "JUMP TO L001". Then, RUN the program again.

Instructions within your programs are normally executed from top to bottom. LOOPS change this execution sequence.

INSTRUCTIONS CONTINUED

JUMP TO L001: Changes the normal program flow by jumping to its accompanying label. "JUMP TO L002" jumps to label "L002". "JUMP TO..." and its accompaning label ranges 001-255. Labels MUST be defined for JUMP TO..., JSUB TO...and RECURSE or the program will stop.

JSUB TO L001
RETURN: Jumps to a subroutine in your program. A subroutine is a section of the program that ends in a RETURN. The RETURN brings you back to the instruction AFTER the JSUB. This is useful when a task must be performed several places in the program.

RECURSE A B: THIS INSTRUCTION IS FOR THOSE OF YOU WHO ARE VERY ADVANCED USERS OF THE DESIGNER'S PENCIL™. Recursion is a complex programming technique that enables a program to "call upon itself" while it is RUN-NING. The sequence is as follows:

- LOO1 MUST precede the RECURSE A B instruction.

- When the program reaches the RECURSE A B instruction, it is sent back to L001. This would continue forever if there was no way to specify how many "levels" of recursion you want to execute before continuing on with the program. Once the program reaches the final "level", it backtracks back to the original recursion level and then continues on with the program. The second variable "B" specifies how many levels to "recurse", and automatically increases by 1 every time the "RECURSE" instruction is executed. Therefore, by testing "B", you can decide how many levels of recursion to execute.

EXAMPLE:

The form of a recursion program.

L001	SET A = 002	7 IS THE FINAL LEVEL
	SKIP IF B<7	ONCE B = 7, STOP EACH LEVEL
		OF RECURSION
	A = A+2	THESE INSTRUCTIONS ARE
	GO UP (A)	EXECUTED ON THE WAY TO THE
	GO RIGHT (A)	DEEPEST LEVEL
	RECURSE A B	RESTART AT L001
	GO DOWN (A)	THESE INSTRUCTIONS ARE
	GO LEFT (A)	EXECUTED ON THE WAY BACK
		FROM THE DEEPEST LEVEL
	STOP	WHEN THE FIRST LEVEL IS FINALLY
		FINISHED, END FOR GOOD

Notice how for every level of recursion, the size of the box gets bigger. This is the value of (A) being incremented by 2. On the way back from the highest level, (A) contains its previous value.

See 'TREE01' and 'CUBES' in the demos for recursion examples. Also books on other languages with recursion will give applicable examples of uses of recursion.

RADIUS: Used in conjunction with the "ARC" instruction. (See below).

ARC A TO 000: Draws a portion of a circle clockwise from point "A" to point "000" with a radius set by the "RADIUS" instruction above. Points are 0-255 clockwise around a circle similar to direction.
EXAMPLE: SET A = 000
RADIUS = 020
ARC A TO 128
This will draw the right half of a circle with a radius of 20.

SET A = 000: Sets "A" equal to the value "000". There are 26 variables to chose from (A-Z). Value ranges from 000-255.

SET A = RN 000: Sets "A" equal to a random number between 0 and whichever number you place in the "000" portion of the instruction. Ranges 000-255.

SET A = PENC X: Sets "A" equal to the current numeric value of the pencil's location along the X Axis. Ranges 000-159.

SET A = PENC Y: Sets "A" equal to the current numeric value of the pencil's location along the Y Axis. Ranges 000-183.

SET A = DAT+A: (See "DATA AT L001" to follow).

SKIP IF A = ,>,<: Skips the next instruction if operation is true. Otherwise, executes next instruction. > means greater than, < means less than.

SKIP IF J2 = UP: Use to draw freehand by entering the following instructions with Joystick plugged into Port 1.

```
           PENCIL OFF
      L005 SKIP IF J2 = UP
           JUMP TO L001
           GO UP 001
      L001 SKIP IF J2 = DN
           JUMP TO L002
           GO DOWN 001
      L002 SKIP IF J2 = LF
           JUMP TO L003
           GO LEFT 001
      L003 SKIP IF J2 = RT
           JUMP TO L004
           GO RIGHT 001
      L004 PENCIL OFF
           SKIP IF B2 ON
           JUMP TO L005
           PENCIL ON
           JUMP TO L005
```

RUN the program. Then, plug Joystick into Port 2 and draw freehand by moving the Joystick and pressing the button. See what happens when you don't press the button.

SKIP IF B2 ON: Skips the next instruction if the button on the Port 2 Joystick is pressed. (See above).

A = A +,−,X,/: Left-side "A" is equal to itself +,−,X,/ the number or numeric value of the variable [A].

PENCIL X = 000: Positions the pencil at any point on the X Axis. Ranges 0-159.

PENCIL Y = 000: Positions the pencil at any point on the Y Axis. Ranges 0-183.

SET A = DAT+A
DATA AT L001

DATA 000: These three are used together and are for ADVANCED user's of The Designer's Pencil™. In combination, they allow the program to read data from the list of numbers in the "DATA 000" instruction(s) located at the specified label. The first "DATA 000" instruction MUST be labeled with the same label number as in the "DATA AT L000" instruction. The "SET A = DAT+A" instruction tells the program which one of the "DATA 000" instructions to get data from.

EXAMPLE:

```
DATA AT L001
SET B = 0
SET A = DAT+B        /Read the 1st entry-007
SET B = 4
SET A = DAT+B        /Read the 5th entry-222
...
....
L001  DATA 007       /B = 0
      DATA 001       /B = 1
      DATA 023       /B = 2
      DATA 034       /B = 3
      DATA 170       /B = 4
      DATA 222       /B = 5
```

DEBUG [A]: Allows you to watch the value of the selected variable change as the program RUNS. Instructions are also displayed as the program RUNS. Display is along the bottom of the screen. The program pauses for a short time between instructions.

VIEW PENCX/Y: Displays the changing horizontal and vertical values of the pencil along the bottom of the screen as the program RUNS at SPEED selected.

This ends our discussion of the Instructions. The intent is not to learn all of them at once. Nor is the intent to learn ANY of them by just reading about them.

The best method for learning is DOING. Select the ones that you understand best and EXPERIMENT with them. Write short and simple programs first. Add new instructions and SEE what effect they have on your designs. You'll be surprised how easy most of the instructions are to use and how quickly you'll understand the others.

Another good way to learn is to watch the DEMO programs in action. Study them. Change their SPEED instruction(s) to slow them down. Add your own instructions. It won't be long before you'll be designing programs that are just as good...or BETTER!

SAVE AND LOAD

Your "computer programs" and "designs" can be SAVED to diskette or tape. This is important because once you turn your computer OFF, you lose your program and design. By SAVING, you can later LOAD your program or design back into the computer as though you had never turned the computer off.

HOW TO SAVE YOUR PROGRAMS AND PICTURES

The upper right corner of the Prompt Window is where you "name" your programs and pictures. All of the programs and pictures that you want to SAVE must have unique names. Give them each a name that helps you remember what they are. For example, if you want to SAVE a picture of a house, then you might name your picture "HOUSE". If you wanted to SAVE another picture of a house, then you might name the second house, "HOUSE1". Just remember: DO NOT NAME TWO PICTURES OR TWO PROGRAMS WITH THE IDENTICAL NAME. If you do, you will lose your first picture or program.

To NAME a program or picture:

1. Point arrow at the current "FILENAME" and press the button.

2. Move the Joystick until the first letter you want in your "new" name appears. Then press the button.

3. Continue changing the rest of the letters until the arrow automatically points at "PRG". Move the Joystick to the right and "PRG" changes to "PIC". "PRG" is for saving your programs, whereas "PIC" is for saving your pictures.

To SAVE your program or picture:

1. Execute the FILE command.

2. Execute "I/O". I/O stands for Input/Output.

3. Execute "PROGS". Execute "SAVE".

4. Execute "DISK" or "TAPE", whichever applies.

5. Execute "YES" or "NO".

- If you selected "DISK" AND "YES", then your program or picture will automatically SAVE to DISK.

- If you selected "TAPE" AND "YES", follow further instructions at the bottom of the screen.

NOTE: *If you accidentally try to save to tape and do not have a tape player, you will have to hit "RESTORE" to return to the title screen, and your program and picture will be lost!*

- If you selected either "DISK" or "TAPE" and then chose "NO", the arrow will jump to the VIEW command and you will have to start the SAVE procedure over.

  When SAVING to TAPE, write down the FILENAME of your program or picture AND the beginning counter number of your tape player on a piece of paper. If you don't, you will NOT know the FILENAME or where to position the tape when you try to LOAD the program or picture back into the computer.

  It is not necessary to write down FILENAMEs on a piece of paper when SAVING to diskette.

To LOAD from diskette:

1. Execute FILE command.

2. Execute "I/O". Execute "PROGS".

3. Execute "LOAD".

4. Execute "DISK".

- The FILENAMEs of the programs and pictures that you had previously SAVED automatically LOAD into the computer and you can cycle through the list the same way that you did when cycling through the list of DEMO names. When the FILENAME that you want appears, press the button, execute "YES", and the program or picture will LOAD.

To LOAD from tape:

1. Change the FILENAME line until the program or picture FILENAME that you want is exactly as you had previously SAVEd it.

2. Position your tape at the starting point for the program or picture that you wish to LOAD.

3. Execute steps 1., 2. and 3. as described above for diskette.

4. Execute "TAPE".

5. Execute "YES", being certain that the FILENAME and position of tape in the tape player are accurate.

6. Press "PLAY" on tape.

● Your program or picture will begin LOADING.

NOTE: *If you accidentally try to LOAD from a tape and do not actually have a tape player hooked-up, press RESTORE to return to title screen.*

The pencil is always visible when **PICTURES** are LOADED from either diskette or tape. To HIDE the pencil, press the button, DELETE the "CLEAR SCREEN" instruction in the Program Area and execute the "HIDE PENCIL" instruction. Then, execute the RUN command.

PRINTING

The Designer's Pencil™ allows you to **PRINT** your programs or pictures. Of course, you must have a printer to enjoy this capability.

Printers that are compatible with **The Designer's Pencil**™ are:

For PROGRAM Printing: COMMODORE MPS801
COMMODORE 1526
OKIDATA OKIMATE 10

For B/W PICTURES: COMMODORE MPS801
OKIDATA OKIMATE 10

For COLOR PICTURES: OKIDATA OKIMATE 10

Other printers may be used if equivalent to those listed above.

To PRINT:

1. Execute the FILE command. Execute PROGS.

2. Execute PRINT. Your program or picture will then print.

To PRINT IN COLOR on an OKIMATE 10:

1. SAVE picture with the FILENAME beginning with "**UR**". Example: URTREE/PIC

2. Run the COLOR PRINT program supplied by OKIDATA.

3. Select user picture option.

4. Choose a file and PRINT.

ERROR MESSAGES

The message "**I/O ERROR**" may appear in the upper left corner of the Prompt Window. This is a warning to you that something is not behaving as expected. Examples of causes are:

- Disk Drive, Printer or Tape Player is not connected to your computer or is not turned on.

- Wrong FILENAME is used.

- Diskette or tape are destroyed.

- Tape is not positioned properly.

- Incompatible printer (See "**PRINT**")

- Disk Drive, Printer or Tape Player are not functioning.

CHART FOR DIRECTIONS AND ARC VALUES (0-225)

```
000 = UP
032 = 45 DEGREES
064 = RIGHT                         000
128 = DOWN        224          ---          032
192 = LEFT
                          X           X
                        1               1
              192    1               1    064
                        1               1
                          X           X
              160          ---          096

                          128
```

CHART FOR NOTE VALUES WHEN USING
NOTE CH1=(A)

Number In Var	Note	Number In Var	Note
0	REST	31	F# 3
1	C 1	32	G 3
2	C# 1	33	G# 3
3	D 1	34	A 3
4	D# 1	35	A# 3
5	E 1	36	B 3
6	F 1	37	C 4
7	F# 1	38	C# 4
8	G 1	39	D 4
9	G# 1	40	D# 4
10	A 1	41	E 4
11	A# 1	42	F 4
12	B 1	43	F# 4
13	C 2	44	G 4
14	C# 2	45	G# 4
15	D 2	46	A 4
16	D# 2	47	A# 4
17	E 2	48	B 4
18	F 2	49	C 5
19	F# 2	50	C# 5
20	G 2	51	D 5
21	G# 2	52	D# 5
22	A 2	53	E 5
23	A# 2	54	F 5
24	B 2	55	F# 5
25	C 3	56	G 5
26	C# 3	57	G# 5
27	D 3	58	A 5
28	D# 3	59	A# 5
29	E 3	60	B 5
30	F 3		

Values > 60 Wrap Around, i.e., 61=0, 62=1,....

CHART FOR CHARACTERS WHEN USING WRITE (A)

Number In Var	Char	Number In Var	Char
0	SPACE	31	<
1	A	32	SPACE
2	B	33	MULT SIGN
3	C	34	"
4	D	35	
5	E	36	
6	F	37	
7	G	38	35-42 ARE THE
8	H	39	ACTIVISION LOGO
9	I	40	
10	J	41	
11	K	42	
12	L	43	+
13	M	44	UNDERLINE
14	N	45	-
15	O	46	#
16	P	47	/
17	Q	48	0
18	R	49	1
19	S	50	2
20	T	51	3
21	U	52	4
22	V	53	5
23	W	54	6
24	X	55	7
25	Y	56	8
26	Z	57	9
27	[	58	GRAPHIC VERT LINE
28	=	59	GRAPHIC HORZ LINE
29	]	60	UPPER LEFT CURVE
30	>	61	UPPER RIGHT CURVE
		62	LOWER LEFT CURVE
		63	LOWER RIGHT CURVE

Values >63 Wrap Around, i.e., 64=0, 65=1,

CHART OF THE 16 COMMODORE COLORS WHEN USING COLOR 1=(A)

000	=	BLK	=	BLACK
001	=	WHT	=	WHITE
002	=	RD1	=	RED
003	=	CYN	=	CYAN
004	=	PUR	=	PURPLE
005	=	GN1	=	GREEN
006	=	BL1	=	BLUE
007	=	YEL	=	YELLOW
008	=	ORN	=	ORANGE
009	=	BRN	=	BROWN
010	=	RD2	=	LIGHT RED
011	=	GR1	=	DARK GREY
012	=	GR2	=	MEDIUM GREY
013	=	GN2	=	LIGHT GREEN
014	=	BL2	=	LIGHT BLUE
015	=	GR3	=	LIGHT GREY

Values > 15 Wrap Around i.e., 16 = 0, 17 = 1,....

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